

INSERT

The Insert statement is used to add one or more rows to a table. They can contain hard coded values or can use subqueries to retrieve data from other tables to insert.

Simplified Syntax:

```
Insert [into] table_name
    [(column list)]
    {Values
        ({DEFAULT | NULL | expression}, . . . )
    |
    Select};
```

Argument	Description
[into]	Is an optional keyword that makes the statement more readable
table_name	The name of the table that you are creating the new row(s) in
(column list)	Is a list of columns that will receive data. The column list must be comma delimited and enclosed in parenthesis. If the column list is omitted (VERY bad programming practice), the database expects to receive data for all columns in the table and expects to receive the data in the order the columns were defined when the table was created.
Select	A valid select statement that returns row(s) of data to be loaded into the table.

Argument	Description								
Values ()	Introduces a list of data values to be inserted as the new row in the table. There must be one data value for each column in the column list (if specified) or in the table. The data values are comma delimited. The data values list must match the column list (if coded) or must match the order the columns were defined when the table was created. An individual data value can be: <table> <tr> <th>Data Value</th><th>Meaning</th></tr> <tr> <td>An expression</td><td>A constant, variable or expression that defines the data value.</td></tr> <tr> <td>DEFAULT</td><td>SQL uses the default value, as defined by the default constraint for the column</td></tr> <tr> <td>NULL</td><td>SQL stores the null value in the column. The column must be defined to allow nulls when the table was created.</td></tr> </table>	Data Value	Meaning	An expression	A constant, variable or expression that defines the data value.	DEFAULT	SQL uses the default value, as defined by the default constraint for the column	NULL	SQL stores the null value in the column. The column must be defined to allow nulls when the table was created.
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If an Insert statement supplies data that does not comply with the constraints defined for a column or supplies data that is incompatible with the data type of the column the Insert fails, and an error message is issued by the database.

In general, there are three ways to do an insert:

1. Select data from another table (e.g. a backup or lookup table).
2. Hard code the data values in the Insert statement itself.
3. A combination of methods 1 and 2.

To add a new IQSchool staff record with all column values provided:

```
Insert Into Staff
    (StaffID, FirstName, LastName, DateHired, DateReleased,
     PositionID, LoginID)
Values
    (25, 'Alex', 'Code', '2024-10-01', Null,
     4, 'acode');
```

Note:

- The list of values is in the same order as the column list
- The keyword null is used to insert a value of null in DateReleased column.

The same record could also be inserted as follows:

```
Insert Into Staff
Values
    (30, 'Alex', 'Code', '2024-10-01', Null, 4, 'acode');
```

Note that:

1. The values are supplied in the order that they appear in the table definition.

****This is not the recommended method and will not be considered acceptable in this course****

Sometimes data to be inserted is selected from the database. Data to be inserted can be provided by the user, selected from the database, or a combination of them both.

```

Insert Into Staff
    (StaffID, FirstName, LastName, DateHired, DateReleased,
     PositionID,
     LoginID)
Values
    (35, 'Alex', 'Code', '2024-10-01', Null,
     (Select PositionID From Staff
      Where FirstName = 'Robert' And LastName = 'Smith'),
     'acode');

```

This Insert statement would insert a new record for Alex Code and assign him the same PositionID as Robert Smith.

It is important to remember that the subquery must only return 1 value to be used in the insert statement. If the subquery returns more than one value, an error will occur.

ERROR: more than one row returned by a subquery used as an expression

You can also insert a record with one insert statement with multiple subqueries (with or without delimiters) used as values:

```

Insert Into Staff
    (StaffID, FirstName, LastName,
     DateHired, DateReleased,
     PositionID, LoginID)
Values
    (
     (Select Max(StaffID) + 1 From Staff), 'Sarah', 'Lin',
     '2025-10-01', Null,
     (Select PositionID From Position
      Where PositionDescription = 'Instructor'), 'slin'
    );

```

If a column is defined with a default constraint the default can be used in the insert with the keyword default OR the column name can be omitted from the column list and no value provided for the column. Note: there are currently no defaults in the IQSchool database tables.

```
Insert Into Staff
    (StaffID, FirstName, LastName, DateHired, DateReleased,
    PositionID,
    LoginID)
Values
    (50, 'Alex', 'Code', Default, Null, 4,
    'acode');
```

OR

Note: The DateHired column is not in the following column list:

```
Insert Into Staff
    (StaffID, FirstName, LastName, DateReleased, PositionID,
    LoginID)
Values
    (52, 'Alex', 'Code', Null, 4, 'acode');
```

You can also insert multiple records with one insert statement with all hardcoded values:

```
Insert Into Staff
    (StaffID, FirstName, LastName, DateHired, DateReleased,
    PositionID,
    LoginID)
Values
    (55, 'Maria', 'Lopez', '2025-09-01', Null, 1, 'mlopez'),
    (60, 'David', 'Kim', '2025-09-01', Null, 2, 'dkim'),
    (65, 'Helen', 'Zhou', '2025-09-15', Null, 3, 'hzhou');
```